

Solutions

Linear Equations & Inequalities

Name:

Solve the Equation

$$1. \quad 4 + \frac{3}{8}x = 7$$

$$\frac{-4}{\cancel{\frac{8}{3}} \times \frac{3}{8}} x = \frac{-3}{\cancel{\frac{8}{3}}}$$

$$\boxed{x = 8}$$

$$2. \quad 4(x+1) = 2(x+2)$$

$$4x+4 = 2x+4$$

$$\frac{-2x}{-2x} \quad \frac{-4}{-4} \quad \frac{4}{-4}$$

$$\frac{2x}{2} = \frac{0}{2}$$

$$\boxed{x = 0}$$

$$3. \quad -x+15+3x+15 = -4$$

$$2x+30 = -4$$

$$\frac{-30}{2} \quad \frac{-34}{2}$$

$$\boxed{x = -17}$$

$$4. \quad -\frac{4}{3}x = 8\left(\frac{1}{2}x-3\right)$$

$$3\left(-\frac{4}{3}x\right) = (4x-24)3$$

$$-4x = 12x-72$$

$$\frac{-4x}{+4x} = \frac{12x-72}{+4x}$$

$$0 = 16x-72$$

$$\frac{72}{16} = x$$

$$\boxed{x = \frac{9}{2}}$$

$$7. \quad \frac{-\frac{4}{7}(q+6)}{-3} = \frac{1}{2}q$$

$$3\left(-\frac{4}{7}(q+6)\right) = -3\left(\frac{1}{2}q\right)$$

$$4\left(-\frac{4}{7}(q+6)\right) = \left(-\frac{3}{2}q\right)4$$

$$-8(q+6) = -21q$$

$$-8q-48 = -21q$$

$$13q-48 = 0$$

$$13q = 48$$

$$13q = 48$$

$$8. \quad 10(x+3) - (-9x-4) = x-5+3$$

$$10x+30+9x+4 = x-2$$

$$19x+34 = x-2$$

$$\frac{-18x}{-18x} \quad \frac{-34}{-34} \quad \frac{-2}{-34}$$

$$18x = -36$$

$$\boxed{x = -2}$$

$$6. \quad \frac{\frac{2}{3}(x-12)}{-4} = \frac{-3x}{8}$$

$$-4\left(\frac{\frac{2}{3}(x-12)}{-4}\right) = \left(\frac{-3x}{8}\right)(-4)$$

$$4\left(\frac{2}{3}(x-12)\right) = \left(\frac{3x}{2}\right)4$$

$$4(x-12) = 9x$$

$$4x-48 = 9x$$

$$\frac{-4x}{-4x} \quad \frac{-48-5x}{-48-5x} \quad \frac{-4}{5}$$

$$9. \quad \frac{4\left(\frac{x+3}{2}\right)}{3} = 4+x$$

$$3\left(4\left(\frac{x+3}{2}\right)\right) = (4+x)3$$

$$4(x+3) = 12+3x$$

$$2x+6 = 12+3x$$

$$\frac{-2x}{-2x} \quad \frac{6-12}{6-12} \quad \frac{-6}{-6} = x$$

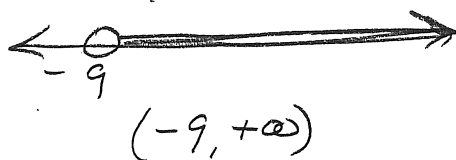
$$\boxed{-6 = x}$$

Solutions

Solve the Inequality and Graph the answer on a number line

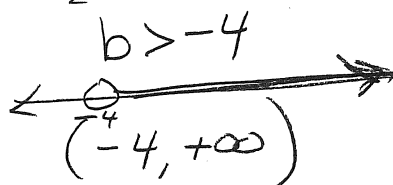
10. $3x - 2 < 4x + 7$

$$\begin{array}{r} -3x \quad -3x \\ \hline -2 < x + 7 \\ -7 \quad -7 \\ \hline -9 < x \\ x > -9 \end{array}$$



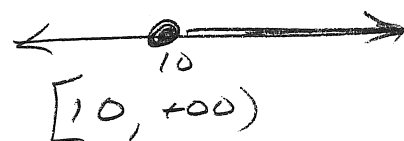
11. $-2(b+1) + 4 < 10$

$$\begin{array}{r} -2b - 2 + 4 < 10 \\ -2b + 2 < 10 \\ -2 \quad -2 \\ \hline -2b < 8 \\ \hline -2 \quad -2 \\ \hline b > -4 \end{array}$$



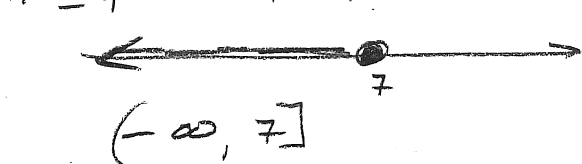
12. $2x + 7 \leq 4x - 13$

$$\begin{array}{r} -2x \quad -2x \\ \hline 7 \leq 2x - 13 \\ +13 \quad +13 \\ \hline 20 \leq 2x \\ \frac{20}{2} \leq \frac{2x}{2} \\ 10 \leq x \quad x \geq 10 \end{array}$$



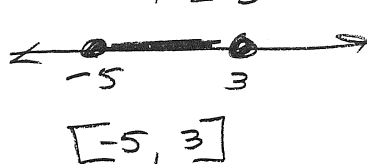
13. $\frac{1}{2}x + 5 \geq \frac{3}{2}x - 2$

$$\begin{array}{r} -\frac{1}{2}x \quad -\frac{1}{2}x \\ \hline 5 \geq x - 2 \\ +2 \quad +2 \\ \hline 7 \geq x \\ x \leq 7 \end{array}$$



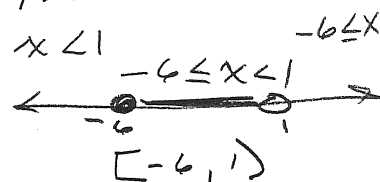
14. $-3 \leq x + 2 \leq 5$

$$\begin{array}{r} -3 \leq x + 2 \text{ AND } x + 2 \leq 5 \\ -2 \quad -2 \quad -2 \quad -2 \\ \hline -5 \leq x \quad x \leq 3 \\ \hline -5 \leq x \leq 3 \end{array}$$



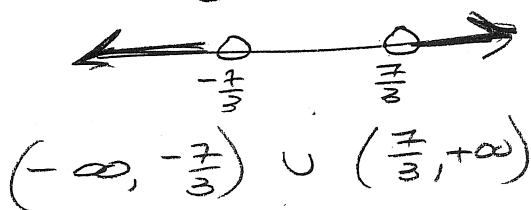
15. $6 < 10 - 4x \leq 34$

$$\begin{array}{l} 6 < 10 - 4x \text{ AND } 10 - 4x \leq 34 \\ -10 \quad -10 \quad -10 \quad -10 \\ \hline -4 < -4x \text{ AND } -4x \leq 24 \\ \hline \frac{-4}{-4} < \frac{-4x}{-4} \text{ AND } \frac{-4x}{-4} \leq \frac{24}{-4} \\ 1 < x \text{ AND } x \geq -6 \end{array}$$



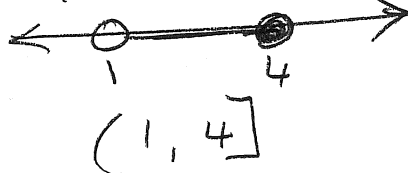
16. $-3x > 7 \text{ or } 3x \geq 7$

$$\begin{array}{r} -3x > 7 \\ \hline -3 \quad -3 \\ \hline x < -\frac{7}{3} \end{array} \quad \text{OR} \quad \begin{array}{r} 3x \geq 7 \\ \hline x \geq \frac{7}{3} \end{array}$$



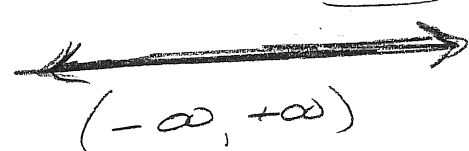
17. $-20 \leq -5x < -5$

$$\begin{array}{r} -20 \leq -5x \text{ AND } -5x < -5 \\ \hline \frac{-20}{-5} \leq \frac{-5x}{-5} \text{ AND } \frac{-5x}{-5} < \frac{-5}{-5} \\ 4 \leq x \text{ AND } x < 1 \\ \hline 1 < x \leq 4 \end{array}$$



18. $\frac{3}{2}(x-2) \leq 6 \text{ or } \frac{1}{5}(2x-3) \geq 3$

$$\begin{array}{l} \frac{3}{2}x - 3 \leq 6 \quad \frac{2}{5}x - \frac{3}{5} \geq 3 \\ +3 \quad +3 \quad -\frac{3}{5} \quad -\frac{3}{5} \\ \hline \frac{3}{2}x \leq 9 \quad \frac{2}{5}x \geq \frac{18}{5} \\ (\frac{2}{3}) \frac{3}{2}x \leq 9(\frac{2}{3}) \quad (\frac{5}{2}) \frac{2}{5}x \geq \frac{18}{5}(\frac{5}{2}) \\ x \leq 6 \quad \text{OR} \quad x \geq 6 \end{array}$$



19. $2 - (7 - y) \geq 2y - (6 - 4y)$

$$\begin{array}{r} 2 - 7 + y \geq 2y - 6 + 4y \\ -5 + y \geq 6y - 6 \\ -y \quad -y \\ \hline -5 \geq 5y - 6 \\ +6 \quad +6 \\ \hline 1 \geq 5y \\ \frac{1}{5} \geq y \end{array}$$

20. $-2[3x - (5x + 1)] > -3(x + 2)$

$$\begin{array}{r} -2[3x - 5x - 1] > -3x - 6 \\ -2[-2x - 1] > -3x - 6 \\ 4x + 2 > -3x - 6 \\ +3x \quad +3x \\ \hline 7x + 2 > -6 \\ \hline 7x > -8 \\ \frac{7x}{7} > \frac{-8}{7} \\ x > -\frac{8}{7} \end{array}$$